

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and following remarks, is respectfully requested.

Claims 1, 3, 5-7, 9-11, and 13-16 are pending in this application. Claims 14 and 15 remain withdrawn from consideration. By this amendment, Claims 1 and 11 are amended; Claims 2 and 12 are canceled; and no claims are added herewith. Support for the amendments to Claims 1 and 11 can be found at least in original Claims 2 and 12, respectively, and in the specification in para. [0032] beginning on page 13, for example. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action, Claims 1-3, 5, and 9 were rejected under 35 U.S.C. § 103(a) as unpatentable over WO 03/105544 to Ishibashi in view of U.S. Publication No. 2004/0149741 to Ishii and U.S. Publication No. 2001/0050059 to Hongo; Claims 6, 7, and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ishibashi in view of Ishii, Hongo, and U.S. Patent No. 6,091,045 to Mabuchi; Claim 10 was rejected under 35 U.S.C. § 103(a) as unpatentable over Ishibashi in view of Ishii, Hongoh, and U.S. Publication No. 2004/0002221 to O'Donnell; and Claims 11-13 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Publication No. 2002/0066536 to Hongoh in view of Hongo.

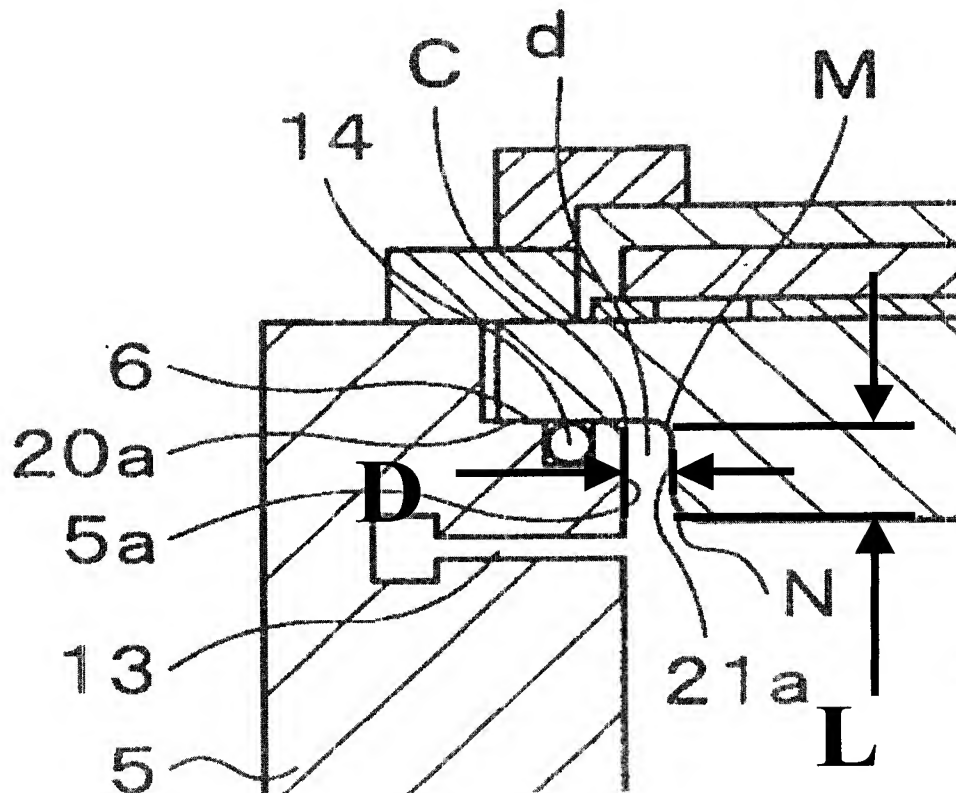
With respect to the rejection of Claims 1-3, 5, and 9 under 35 U.S.C. § 103(a) based on Ishibashi in view of Ishii and Hongo, that rejection is respectfully traversed.

Amended Claim 1 recites, in part:

wherein said transmissive window has, in a center area thereof, a hanging portion . . . , and **a gap with a predetermined distance or more is formed between an outer peripheral surface of the hanging portion and a sidewall of said support part,**

wherein L/D is equal to 3 or more, where L is a vertical length of the hanging portion and D is the predetermined distance, **D being set to 0.5 to 10 mm so that a contact point between the support part and the transmissive window is not in direct sight from the substrate,** and

In summary, in the plasma processing apparatus of Claim 1, the transmissive window has, in a center area thereof, a hanging portion, and a gap with a predetermined distance or more is formed between an outer peripheral surface of the hanging portion and a sidewall of said support part. Further, L/D is equal to 3 or more, where L is a vertical length of the hanging portion and D is the predetermined distance, D being set to 0.5 to 10 mm so that a contact point between the support part and the transmissive window is not in direct sight from the substrate.¹ See the portion of Fig. 3 reproduced herein below, with emphasis, for reference.

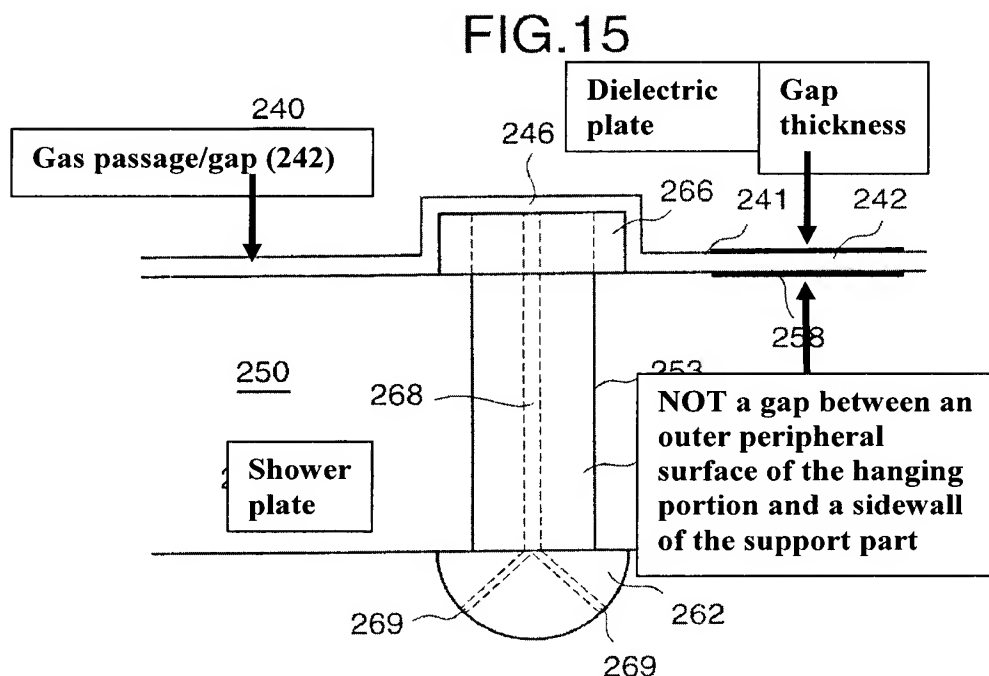


Specification, portion of Fig. 3 (emphasis added)

¹ The features of Claim 1 provide the following advantages: First since the ratio between the vertical length L of the hanging portion and the distance D of the gap (L/D), is equal to 3 or more, the outer peripheral surface of the hanging portion functions as a shielding wall to prevent the contact point between the support part and the transmissive window from coming into sight of the substrate. Thus, sputtered particles and radicals and plasma near the peripheral edge portion of the support part on the inner side of the process vessel are blocked by the shielding wall, reducing the radicals reaching the substrate. See the specification, pgs. 3 and 21. Second, since a strong impedance change point occurs on the outer peripheral surface of the hanging portion, the microwave propagating outward from the inside of the transmissive window reflects thereon. As such, electric field concentration in a peripheral edge portion of the support part on the inner side of the process vessel is alleviated, which can inhibit the generation itself of a strong electric field and high-density plasma in the peripheral edge portion of the support part on the inner side of the process vessel.

Turning to the applied art, Applicants appreciate the acknowledgement in the Office Action that Ishibashi in view of Ishii does not teach or suggest either the gap with a predetermined distance being formed between an outer peripheral surface of the hanging portion and a sidewall of the support part, or that L/D is equal to 3 or more, where L is a vertical length of the hanging portion and D is the predetermined distance. The Office Action asserts, however, that Hongo remedies the above deficiencies of Ishibashi in view of Ishii. Applicants respectfully disagree.

In particular, the gap (242) of Hongo is a gas passage disposed **between the dielectric plate (240) and the shower plate (250)**, as clearly shown in Fig. 15, reproduced herein below. Hongo, para. [0092]. The gas passage/gap (242) extends substantially horizontally between the two plates, with exception of where the passage crosses a recessed portion (246). Hongo, para. [0096] and Fig. 15. Nevertheless, the stated example thickness of the gas passage/gap of 0.5 mm is merely a distance of a space between dielectric plate (240) and shower plate (250), which, incidentally, is primarily a vertical direction. Therefore, gas passage/gap (242) of Hongo is *completely* different from the recited predetermined distance (D) of Claims 1 and 11. That is, one of ordinary skill in the art would not compare the gas passage/gap (242) of Hongo with the gap in the instant application, as the gas passage for flow between the inlet port (241) and the outlet port (244) is clearly not a gap with a predetermined distance being formed **between an outer peripheral surface of the hanging portion and a sidewall of the support part**. See Hongo, Fig. 15 below. As such, the thickness of the gap does not relate to the instant application.



Hongo, Fig. 15 (emphasis added)

Accordingly, Hongo clearly does not teach or suggest a gap with a predetermined distance being formed between an outer peripheral surface of the hanging portion and a sidewall of the support part, as recited in Claim 1.²

Thus, Ishibashi in view of Ishii and Hongo does not teach, suggest, or render obvious all of the features recited in independent Claim 1 or any of the claims depending therefrom. Therefore, withdrawal of the rejection under 35 U.S.C. § 103(a) based on Ishibashi in view of Ishii and Hongo, is respectfully requested.

Additionally, Mabuchi and O'Donnell do not teach or suggest that L/D is equal to 3 or more, where L is a vertical length of the hanging portion and D is the predetermined distance, or that the predetermined distance is set to 0.5 to 10 mm so that a contact point between the

² Furthermore, the Office Action asserts on page 5 that the gap space (242) of Hongo “is provided for generation of plasma.” Applicants submit, however, that paragraph [0100] of Hongo states the exact opposite. That is the “gap space 242 is provided for *preventing* generation of plasma.” On the other hand, the gap having distance D of the instant application is for inhibiting the generation of a strong electric field by neutralizing charge-up with plasma entering the gap. See paragraph [0009] of the Specification. Thus, gap space (242) of Hongo is for preventing generation of plasma, while the gap of the instant application provides a way for plasma to enter.

support part and the transmissive window is not in direct sight from the substrate. As such, O'Donnell does not remedy the deficiencies of Ishibashi in view of Ishii and Hongo, as discussed above. Accordingly, no reasonable combination of Ishibashi, Ishii, Hongo, Mabuchi, and O'Donnell would include all the features recited in amended Claim 1 or any of the claims depending therefrom. Therefore, withdrawal of the rejections under 35 U.S.C. § 103(a) based on Ishibashi in view of Ishii and Hongo and one of Mabuchi, and O'Donnell, is respectfully requested.

With respect to the rejection of Claims 11-13 under 35 U.S.C. § 103(a) as unpatentable over Hongoh in view of Hongo, that rejection is respectfully traversed.

Applicants appreciate the acknowledgement in the Office Action that Hongoh does not teach or suggest the recited feature of the eave portion in Claim 11. Applicants respectfully submit, however, that Hongo fails to remedy the above-mentioned deficiency of Hongoh for multiple reasons.

First, Fig. 1 of Hongo is misleading in that in the attempt to show that the gas enters the vessel circumferentially, it appears to show that the gas supply rings (170) and (140) project into the process chamber (102). This is inaccurate. Fig. 6B of Hongo is a cross-sectional view of the gas supply ring (140) and more accurately depicts that the inner circumference of the gas supply rings are *flush* with the walls of the process chamber (102). While Fig. 6B only depicts gas supply ring (140), Hongo explicitly states that the gas supply line (170) “has the same structure as the gas supply ring 140.” Hongo, para. [0064]. Therefore, as shown in Fig. 6B of Hongo, the inner circumference of the gas supply ring (170) is flush with the chamber (102) wall and **does not project** from the sidewall into the process vessel, as recited in Claim 11.

Second, even assuming *arguendo* that the gas supply ring (170) projects into the chamber like the recited eave portion, *which it does not*, the asserted thickness of the gas

passage/gap (242) has nothing to do with the predetermined distance between the support part and a lower surface of said transmissive window, recited in Claim 11, as explained above with respect to Claim 1. Although the gap “e” (see Fig. 6 and para. [0040] of the instant application) recited in independent Claim 11 is somewhat different than the gap (D) of Claim 1, the same argument above with respect to Claim 1 regarding the inapplicability of Hongo applies to Claim 11. That is, Claim 11 recites that the eave portion is separated from the contact point *between the support part and a lower surface of said transmissive window by a predetermined distance* and the predetermined distance is set to 0.5 to 10 mm so that the contact point between the support part and the transmissive window is not in direct sight from the substrate. In contrast, the gas passage/gap (242) of Hongo is only between the shower plate (250) and the dielectric plate (240). Thus, the gap (242) is not equivalent to the predetermined distance between the eave and the transmissive window, and the size thereof cannot be compared.

Accordingly, Hongoh in view of Hongo does not teach, suggest, or render obvious all of the features recited in independent Claim 11 or any of the claims depending therefrom. Therefore, withdrawal of the rejection under 35 U.S.C. § 103(a) based on Hongoh in view of Hongo, is respectfully requested.

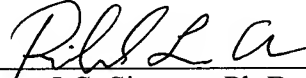
In addition, it is respectfully submitted that dependent Claims 3, 5-7, 9, 10, and 16, which depend from Claim 1, and dependent Claim 13, which depends from Claim 11, are in condition for allowance for at least the same reasons discussed above with respect to independent Claims 1 and 11, as well as for the additional features recited therein.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below-listed telephone number.

Respectfully submitted,

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